REMARKS

A petition for a three month extension of time has today been filed as a separate paper and a copy is attached hereto.

The examiner will note that claim 5 has been cancelled and its limitations have been incorporated into claim 1 as amended. Further, claim 1 has been amended to define what applicants' mean by "see-through." As explained in the "Background" of applicants' specification, the present invention is intended to allow advertising displays to be projected onto, for example, show windows of shops which, at present, is not feasible because windows do not well display projected images because of their high transparency (page 1, last paragraph, substitute specification). While a conventional light transmitting screen could be attached to the show window, the presence of the screen would make it "impossible to see displayed goods from the outside," quoting from page 2, lines 1-4. Thus, the present invention is directed to providing a surface which simultaneously allows one to view through the screen to see background behind the screen and view an image projected on the screen. See, for example, page 13, lines 25-28 of the Substitute Specification and the objective taught at page 2, lines 6-9 thereof. Also see page 15, lines 10-11, page 17, lines 17-18, page 19, lines 7-8 and page 20, lines 2-3 of the specification.

In contrast, Watanabe et al is directed to a screen for a rear-projection type projector, and a light diffusion plate for a back light of liquid crystal displays and plasma displays. See column 1, lines 8-15. Likewise, the examiner's secondary reference applied against claim 6, Iwata et al, is directed to "the display of a word-processor, computer, television set, or the like," quoting from column 1, lines 13-15. In such displays of the prior art, one would not want a screen

designed to simultaneously display a projected image and background behind the screen. The displays of Watanabe et al and Iwata et al are designed solely as displays for projected images. It can be appreciated that it would be somewhat undesirable to see through a television screen to within the cathode ray tube or plasma display unit to see tube or display components in addition to a projected image. Such would be highly undesirable in the context of the intended uses of the apparatus disclosed in the cited references. In contrast, as taught in applicants' Background section, applicants' invention is directed to an entirely different application such as the projection of displays onto shop windows while allowing simultaneous viewing of the shop contents through the window. It is respectfully submitted that it would not have been obvious to modify the disclosure of Watanabe et al in a manner to meet applicants' claims which would involve changing the properties of the screen in a manner both detrimental to the intended uses suggested by Watanabe et al and in a manner furthering applicants' intended purpose, i.e., simultaneous "see-through" and display of a projected image, an objective in no way suggested by the teachings of Watanabe et al or Iwata et al.

In view of the present amendment incorporating the limitations of claim 5 into claim 1, the rejection of claims 1-4 and 7-13 for anticipation, as set forth in paragraph 2 of the office action, is now moot.

The rejection for anticipation or, in the alternative, obviousness over Watanabe et al, as set forth in paragraph 4 of the office action, is respectfully traversed for the reasons which follow.

Definition of A "See-Through" Transmitting Type Screen

As Dr. Etori explains in his second declaration (attached) "see-through" means literally that one can see something through the "see-through" object. The word "see-through" is used in this sense in applicants' specification. As Dr. Etori further explains with reference to the attached Fig. 1, when an object behind the screen can be seen by a viewer irrespective of the distance L, the screen is considered a "see-through" screen. On the other hand, when an object spaced behind the screen cannot be seen by a viewer, the screen is not "see-through".

In order to illustrate the difference between the "see-through screen" and "non-see-through screen", Dr. Etori conducted an experiment using a test screen made of a transparent acrylic plate, half of which was transparent, i.e., "see-through" and the other half of which was "non-see-through," e.g. Watanabe et al. A board on which a character "A" was printed was placed behind the test screen at a distance of 0.5m, 0.1m or 0m and a photograph was taken at each distance. The photographs are shown in Fig. 2. When the board was placed at a distance of 0.5m, the character "A" could not be recognized at all through the left half of the test screen whereas it could be clearly seen through the right half. When the board was placed at a distance of 0.1m, the character "A" became visible but dim through the left half of the test screen. When the board was in contact with the screen, all of the character "A" could be seen through the left half of the screen, illustrating the case of an image focused on a rear projection screen.

Watanabe et al Do Not Disclose or Suggest a "See-Through" Screen

As noted above, the screen of Watanabe et al is directed to use with a rear-projection type projector, as shown in Fig, 6 and 7 of Watanabe et al. If the screen of Watanabe et al was a "see-through" transmitting type screen, the inside of the enclosure (behind the screen) would be recognizable (visible) as objects behind the screen. Such images of the objects in the screen background would result in a very poor quality of the projected image. Accordingly, the screen of Watanabe et al can not be "see-through", because see-through would debase the projected image.

In addition, Watanabe et al use minute balls (spherical micro-particles) to produce a lens effect, i.e., as a "plano lens." See, for example, column 1, lines 8-15 and column 4, lines 24-51. If the image of any background object could be seen through the screen of Watanabe et al, that image would be a vertically and horizontally reversed image because, as illustrated in Figs. 8, 9 and 40 of Watanabe et al, the path of transmitted light through the screen is reversed. Such a light path is not a light path through a "see-through" object.

According to the examiner, in paragraph 6 of the office action, at column 11, lines 22-27, Watanabe et al teaches a "see-through screen". However, at column 11, lines 22-27, Watanabe et al teach neither a "see-through" property nor any comparable property. Perhaps the examiner is focusing on the word "transparent" which is used there by Watanabe et al to characterize "base members" 11, 41 and 31. However, as can be seen from the drawings of

Watanabe et al, those base members are merely components of the screen which also includes a lens 27 and a "minute-transparent-ball disposing layer 14." There is no suggestion in Watanabe et al that the screen, as a whole, be "transparent." Indeed, such "transparency" would be highly undesirable for the applications envisioned by Watanabe et al and, as noted above, would render the envisioned display apparatus wholly unsuitable for the purposes/applications intended by Watanabe et al.

In this connection, the examiner's attention is also again directed to the declaration of Mr. Etori which was filed August 4, 2003. In that declaration, Mr. Etori sets forth in detail seven reasons why the screen of Watanabe et al should not be regarded as a "see-through" screen. Further, it simply stands to reason that, with the video display apparatus disclosed by Watanabe et al, one would not want a feature whereby the viewer would see, in addition to the projected image, an image or images of structural, mechanical and/or electrical components located behind the screen. Such a video display apparatus as envisioned by Watanabe et al, if it were to simultaneously display such images, would not be a product acceptable for its intended purpose.

Watanabe et al Neither Discloses nor Suggests Particles of a Size Within Applicants' Range

In paragraphs 2 and 4 of the office action the examiner cites column 11, lines 44-45 and 51-56 of Watanabe et al for a teaching of a range of particle diameter of 1.0 micron - 10 microns. The former teaching reads:

> A diameter of the minute transparent ball 12 is set equal to or smaller than 100 μm, e.g., about 50 μm.

The latter teaching at column 11, lines 51-56 is similar and, further contrasts the "lens" of Watanabe et al with "the conventional lenticular lens."

A lower limit for the diameter is not explicitly taught by Watanabe et al. However, Watanabe et al inherently teach a lower limit. For example, at column 12, lines 15-21 of Watanabe et al teach:

> Therefore, since diffusion angles of the plano lens and the screen according to the present invention are determined in accordance with the law of refraction in optics (i.e., Snell's law of refraction), it is possible to obtain a desired diffusion angle ...

Thus, Watanabe et al expressly teach that their invention operates in accordance with Snell's law of refraction (i.e., based on a "geometric optics").

In contradistinction, as taught at page 2, lines 19-22 and at page 6, lines 1-4 of applicants' specification, applicants' invention operates on the principle of Mie scattering (not "geometric optics") which, in turn, provides front scattering.

As applicants further teach at page 7, line 23 to page 8, line 2 (original specification), the particle diameter is such as to reduce backward scattering to the point where the screen exhibits

both the "see-through property" and projected images.

Dr. Etori testified beginning at the bottom of page 4 of his declaration of August 4, 2003 that the balls with too small a diameter do not exhibit refraction explained by Snell's law but, rather, Mie scattering. Because Watanabe et al designed a screen based on Snell's law of refraction, a lower limit of diameter is necessarily fixed at the lower limit for Snell's law. At smaller diameters Mie scattering occurs, which is the operating principle of the present invention, as taught at page 2, lines 13-15 and page 5, last three lines, of applicants' substitute specification. Therefore, applicants' range of particle diameter of 1.0 μm to 10.0 μm which produces Mie scattering is neither disclosed nor suggested by Watanabe et al.

Watanabe et al Do Not Disclose or Suggest a Ratio of Refractive Indices the Range Recited by Claim 1

With regard to claim 5 (now incorporated into claim 1), the examiner cited column 12, lines 15-21 as teaching "a refraction index relative to that of the transparent binder". In point of fact, the teaching the examiner purports to find is not there. In this teaching at column 12 cited by the examiner Watanabe et al teach that the light conversing effect and diffusion angle on the light emission side is determined by both the refractive index of the minute transparent ball and the refractive index of "surrounding portions ". Watanabe gives no hint as to a relationship between the two refractive indices.

Further, Watanabe et al cannot "inherently" teach such a ratio of refractive indices

because the "Plano Lens" of Watanabe et al operates on a different principle than does the "see-through" screen of the present invention and precludes any inference of inherency.

The "plano lens" of Watanabe et al operates on a different principle than the "see-through" screen of the present invention. Again reference is made to column 12, lines 15-21 of Watanabe et al where Watanabe et al expressly teach that their invention operates in accordance with Snell's Law of Refraction. In contradistinction, as taught at page 2, lines 19-22 and at page 6, lines 1-4 of applicants' original specification, applicants' invention operates on the principle of Mie scattering.

Haze and Distinctness of Image - Claim 6

The examiner cites column 3, lines 24-28 and Table 5 of Iwata et al as teaching haze and distinctness values. But there is nothing relevant to distinctness of image in these teachings of Iwata et al. If the examiner regards "Display quality" in Table 5 as "distinctness of image," it is a complete misunderstanding. As this "display quality" is evaluated for a diffusing layer attached on a liquid crystal display, the distance between the displayed image and the screen is essentially zero. Because "distinctness of image" relates to images of objects distanced from the screen (i.e., in the background of the screen) it is quite different from the "display quality" of Iwata et al.

Claims 10 and 12

The examiner further cites column 15, lines 2-6 as teaching "the transparent layer has a refraction index (n) lower than that of the transparent binder of the light scattering layer". This teaching the examiner purports to find is also not there. This latter teaching of Watanabe et al is only a teaching of change in the refractive index of the plano lens 10 or screen 105 from its center to its outermost periphery. It says nothing with regard to any ratio of any refractive indexes.

Finally, column 14, lines 16-20 of Watanabe et al is cited by the examiner as teaching "the transparent layer has a refraction index higher than that of the transparent binder of the light scattering layer", another misinterpretation. The actual teaching is quite different and unrelated. What Watanabe et al actually teach at column 14, lines 16-20 is that as the refractive index of the minute transparent ball becomes larger "the convergence effect is improved and hence the diffusion angle becomes larger." Again, no value, ratio or range for refractive index is disclosed or suggested.

Conclusion

In view of the fact that Watanabe et al specifically teach that their invention operates in accordance with Snell's law, i.e., in accordance with "geometric optics", whereas applicants' specification specifically teaches that their invention operates with Mie scattering and further in

view of the testimony of Dr. Etori as to the difference of the two principles (first declaration), the examiner cannot logically assert that any feature of applicants' invention is inherent in the invention of Watanabe et al. As Dr. Etori testifies to at page 5 of his first declaration, "only in a system satisfying the conditions for Mie scattering can a see-through property and forward scattering be obtained simultaneously.

Respectfully submitted,

George A. Loud
Reg. No. 25,814

Dated: March 30, 2004

LORUSSO, LOUD & KELLY
3137 Mount Vernon Avenue
Alexandria, VA 22305

(703) 739-9393